walkSTEM at Klyde Warren Park
Responses to Questions

These responses to the questions we highlighted in the video guides are provided to help parents, caregivers, and educators deepen and extend the learning experiences for children. We hope you are inspired to keep ***thinking, talking, and asking your own questions*** based on what you notice at Klyde Warren Park. For each video guide listed below, we share one or more learning extension-geared "*Talk about"* conversation starters. **View our open access video collection of walkSTEM tours across North Texas and other parts of the country here.** All our videos and other resources have been designed by STEM educational experts from talkSTEM and Southern Methodist University with support from the National Science Foundation and community partners.

Note: You can view the same YouTube playlist for the walkSTEM at KWP video guides here if you want to use our search filters. You can experience these video guides while at the park on your mobile device in any order you like. You can also preview them before visiting the park with some conversation ahead of time or watch them after a visit to the park as a way to go back and revisit (virtually). Finally, you can even take a virtual field trip to the park and use the video guides to have some fun conversations with your students/children. Enjoy!

Introduction to walkSTEM at Klyde Warren Park

Talk about:

- What is STEM and can you see the world through the lens of STEM?
- What will you do at each walk stop? Think, Talk, and Ask

Playground Spinner in the Children's Playground

What inertia tests can you run on the playground spinner - safely?

You can test inertia by adjusting how fast the spinner spins, how much weight is on it, or where that weight is positioned, and then observing how those changes affect how quickly it spins or how hard it is to stop. Inertia on a playground spinner is the natural resistance of the equipment and your body to changes in motion.

Talk about:

- why it takes a strong push to get the spinner moving (starting inertia), and why it keeps spinning even when you let go (moving inertia)
- where else have you experienced inertia while playing

 **DNA Tower in the Children's Playground**

How can you estimate the height of the DNA Tower using yourself?

You can estimate the tower's height by comparing it to your own height and figuring out how many "you-sized" lengths would stack up to reach the top. One person (with known height) stands against the tower. The second person stands at a distance and estimates how many "heights" of that person make up the tower height. Walk further back and repeat. Make this estimate 3 or 4 times and find the average.

Talk about:

- where are some good places to stand in order to estimate height? Think about pros and cons of being at a higher level (from rotary deck) versus ground level.
- (for children old enough to understand averages) What is the value of using an average based on 3 or 4 estimates versus a single measurement only.

 **Rotary Deck in the Children's Playground**

What's the slope at the Rotary Deck staircase?

You can find the slope of the Rotary Deck stairs by dividing the height of a step (the rise) by its depth (the run), which should be close to 7/11 for a safe and accessible staircase.

Talk about:

- What's the steepest slope you have climbed?
- How is slope important to consider in different activities or places e.g. rollercoasters, wheelchair ramps, ski slopes, hiking, cycling, construction (of a roof)

 **Hunt Oil Building (viewed from the Children's Playground)**

What 3D shapes do you notice at the Hunt Oil Building and beyond?

You might spot cubes, rectangular prisms, pyramids, cylinders, and other geometric shapes in the buildings around you, and those simple forms can inspire all kinds of creative designs and models.

Talk about:

- Your opinions of the pros and cons of using the different 3D shapes in buildings
- What other interesting combinations could you imagine using horizontal and vertical cylinders?

 **Cosmo Climbing Structure in the Children's Playground**

How does the Cosmo Climbing structure rank in terms of symmetry?

It comes second after a sphere which has infinite symmetry. The cosmo climbing structure is close to a truncated icosohedron (or soccer ball shape). Watch the video featuring Dr Glen Whitney, founder of the MoMath Museum in New York to hear the full response to this question.
View the full response video here

Talk about:

- Why soccer balls are not spherical but instead are shaped like the climbing structure we see (A soccer ball is shaped like a truncated icosahedron - a geometric figure with 12 pentagons and 20 hexagons - because it is physically impossible to construct a perfectly round ball out of flat materials without them.)
- Symmetry of objects you see around you e.g. line symmetry (e.g. slide or see saw) and rotational symmetry (e.g. playground spinner or pinwheel)

 **Trees on Either Side (anywhere on the lawn)**

How Far Apart are the Trees?

The planners likely considered factors like how large the trees and their roots would grow, how much sunlight and water they need, the underground support structure, and how people would move through and use the park.

Talk about:

- How the trees benefit your park experience.
- How big would you guess the root system of each tree is compared to the size of the tree. The root system of most trees is surprisingly shallow and wide, often spreading horizontally 1.5 to 3 times the width of the tree's canopy

 **Textures (anywhere in the park)**

What textures can you feel when you walk in the park?

The different walking surfaces at the park each feel unique – some soft, smooth, rough, or bouncy – and they were likely chosen for comfort, safety, play, durability, and to create different experiences in different parts of the park.

Talk about:

- Different textures you have experienced using your sense of touch e.g. soft and fluffy, smooth, rough, bumpy
- What parts of your body are most sensitive meaning they have the most touch receptors (fingertips, toes, lips)

 **Sounds Around the Park (anywhere in the park)**

How to Classify Sounds?

The sounds could be birds, from kids, from cars, music, etc., and you organize them by source: whether it comes from a living thing, a machine, or the wind; or by location: the road, the sky, the lawn; or even by how the sounds make you *feel*: happy, curious, and excited.

Talk about:

- Other ways you could classify sounds e.g. volume (soft or loud); pitch (deep or high); harmony (harmonious or chaotic)
- Other observations that you could classify or organize in a chat e.g. different textures you feel on different walking surfaces here at the park; different types of dogs at My Best Friend's Park

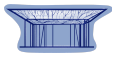
 **My Best Friend's Park**

Is there a math walking pattern you notice at My Best Friend's Park?

Yes, if you watch carefully, you'll notice that dogs use repeating leg-movement patterns.
Talk about:

- What's the advantage to dogs of using the repeated pattern you observe
- How could this pattern compare with the walking pattern of other 4-legged animals
- What is your walking pattern, mathematically speaking?

We explored this same question at the Dallas Zoo and answered it.
Watch the video at the Dallas Zoo

 **Muse Family Performance Pavilion**

What factors went into the design of the Muse Family Performance Pavilion?

Designing the Muse Family Performance Pavilion likely involved balancing practical needs like audience visibility, acoustics, and performance space with aesthetic goals that help the structure fit harmoniously into the park's natural and urban surroundings.
Talk about:

- Your own designs for a performance stage at the park
- What factors went into your design and what else would you like to find out to improve your design?

 **Jane's Lane (any part where you can view the white arches)**

Why do the arches on Janes Lane seem to shrink with distance?

The arches appear to shrink and move closer together because the arches closer to you occupy a wide field of view. In contrast, the arches that are further away from you result in a much smaller field of view and smaller image on your retina. As equally sized objects get farther away, they take up less space in your field of view and seem to converge toward a distant vanishing point. So, this is an optical illusion but your brain has successfully learned this mathematical reality and uses it for depth perception. Instead of being fooled into thinking distant objects are literally smaller, your brain uses these shrinking dimensions to correctly calculate that the arch you see in the distance is not tiny, but rather just further away.

Talk about:

- Other times you notice the same phenomenon e.g. railroad tracks or roads that seem to converge in the distance

 **Visit Dallas Kiosk**

What's the Circumference of the *Visit Dallas* kiosk?

You can estimate the distance around the circular kiosk by counting how many heel-to-toe foot lengths it takes to walk all the way around it once, which gives you an estimate of its circumference.

Talk about:

- Ways to make your estimate as accurate as possible
- What if the kiosk was a different shape - a square or rectangle or pentagon …. What are the pros and cons of each shape if it formed the footprint of the kiosk here at the park?

Nancy Best Fountain

What is the function of the steel sculptures in the Nancy Best Fountain?

The fountain was designed through many creative and practical decisions to blend art, nature, engineering, and safe interactive play into one experience. This was so interesting especially since we got to speak with the designers of this fountain and see their drawings that we decided to share our video response to this question.
View the response video here

Talk about:

- Your own designs for anything you can imagine here at the park e.g. treehouse or obstacle course in the lawn
- What factors went into your design and what design constraints do you have? What else would you like to find out to improve your design?